

SIMTEK6140

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE


In re Application of
Tadashi Takano

App. No.: 09/681430
Filed: April 3, 2001
Conf. No.: 4775
Title: ROTATING ELECTRICAL
MACHINE
Examiner: L. Pham
Art Unit: 2834

Commissioner for Patents
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July 3, 2003


Ernest A. Beutler
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APPELLANTS BRIEF

Dear Sir:

RELATED APPEALS AND INTERFERENCES

There are no other related Appeals or Interferences the outcome of which would have a bearing on or be affected by the decision in this Appeal.

REAL PARTY IN INTEREST

In addition to the appellant, the real party in interest is his assignee, Moriyama Kogyo Kabushiki Kaisha, a Japanese corporation.

STATUS OF THE CLAIMS

Claims 1 through 35 are before the Board on Appeal. A clean copy of these claims is presented in the Appendix to this Brief.

STATUS OF AMENDMENTS

A Proposed Amendment after Final was filed on March 22, 2003, but that Amendment was refused entry even though the Examiner admitted that it "The amendment to claim 1 overcomes the final rejection" (see the Interview Summary dated March 19, 2003), but refused its entry on the basis that "further search and consideration is required".

This amendment is withdrawn, but a proposed amendment is enclosed herewith that addresses only the 35 USC 112 rejections in the final. This amendment is assumed to be entered and is reflected

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in the Appendix. If the Examiner indicates otherwise in her Answer, the appendix will be corrected.

APPELLANT'S INVENTION

Appellant's invention relates to a rotating electrical machine such as an electric motor or an electrical generator, which, as a common occurrence, is related to a rotating shaft of another rotating machine. As examples, if the inventive machine comprises an electric motor, it may be associated in driving relation to the shaft of a hydraulic pump, as shown in the embodiment of FIGS. 1-3. On the other hand, the inventive rotating electrical machine may be an electrical generator driven by, for example, an internal combustion engine. Such an example is not specifically illustrated in the application.

The disadvantages of the prior art constructions is that each machine has its own supporting housing each of which has end closures that carry bearings for supporting and journalling its respective shaft and the shafts are coupled together by exposed couplings. Appellant avoids this costly and cumbersome prior art construction by, in its broadest sense, forming one of the end closures of the rotating electrical machine with a cavity that at least in part houses the associated machine.

In accordance with a further feature of the invention and as seen in FIG. 3 and others, one end closure of the rotating electrical machine carries an end post that extends into the rotating shaft to journal it, thus eliminating the need for two spaced bearings each supporting a respective end of the shaft.

The detail of the various embodiments is described in the Detailed Description portion of the specification beginning before paragraph 0031 and concluding at paragraph 0061, which refer to the drawings in the appropriate manner.

ISSUES BEFORE THE BOARD

The issues before the Board are as follows:

1. Is the subject matter of claims 1-5, 8, 10, 13-15, 17-19, 21, 22, 24, 25, 27-29, 31, 32, and 33-35 anticipated under 35 USC 102(e) by Nakanosono 6,276,457 (Nakanosono)?
2. Is the subject matter of claims 6, 7, 9, 11 and 12 obvious under 35 USC 103(a) from the combination of Nakanosono with Takagi et al 6,081,056 (Takagi)?
3. Is the subject matter of claims 20, 23, 30 and 33 obvious under 35 USC 103(a) from the combination of Nakanosono with Jensen et al 6,140,725 (Jensen et al)?
4. Is the subject matter of claim 26 obvious under 35 USC 103(a) from the combination of

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Nakanosono with Bloch et al 6,169,345 (Bloch et al)?

5 Is the subject matter of claim 16 obvious under 35 USC 103(a) from the combination of Nakanosono with common knowledge?

GROUPING OF THE CLAIMS

The following groups of claims each stand or fall together:

Claims 1 and 9

Claims 3 and 4

Claims 5-7

Claims 10-12

Claims 19-24

Claims 27 and 32

Claims 30 and 33

Claims 29, 31 and 34

APPELLANT'S ARGUMENTS

The main questions before the Board all depend on whether the Nakanosono reference teaches broadly the invention defined initially by claim 1, the first independent claim in the application. This only requires a reading of the claim and as a pivotal point what comprises a "cavity".

Broadly the Nakanosono reference relates to the same general field as appellant's invention, a rotating electrical machine and an associated rotating machine. There the similarity ends. Appellants invention, as already stated comprises a housing for the electrical machine that contains at least in part the associated rotating electrical machine. Nakanosono, on the other hand discloses the mounting of an electric motor in the hub of a driven wheel. Just the opposite of appellant's invention.

Thus we must look to whether the claim language is so broad as to read on the reference, as the Examiner contends. The claim states that the rotating electrical machine housing "first end closure forming a cavity in which a substantial portion of said related rotating machine is contained". It is hard to see how the Examiner can seriously contend that any portion of the driven wheel hub, let alone a

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substantial portion of it, is contained within a cavity of the electric motor end closure.

Nakanosono defines his structure clearly on column 3 lines 56-65 as follows:

"Contained within the cavity formed by the outer hub 19 and its end closure 24, there is an inner housing assembly, indicated generally by the reference numeral 27. This inner housing assembly 27 is comprised of a generally cup-shape member 28 having an integral end wall 29. The opposite end thereof is closed by a closure plate 31 which is fixed to the member 27 in any suitable manner. These pieces 27 and 31 are preferably formed from a lightweight material having a high thermal conductivity such as aluminum or an aluminum alloy."

Almost humorously, the Examiner in her advisory action of May 20, 2003 contends that a flat end wall can "form" a cavity even though it does not "define" one. Appellant's Attorney's rather old Webster's Dictionary defines a cavity as "A hollow place; a hollow; hole; pocket". Apparently the Examiner believes a flat table top is a cavity. She defines the "related rotating machine" in the rejection as the element 68. 68 is described in the reference as a "planetary transmission". However even adopting this strained meaning, the planetary transmission 68 is adjacent the motor housing end wall 29 not "within" it as claimed.

Claim 2 depends on claim 1 and thus partakes of the aforementioned distinction over Nakanosono. In addition this claim calls for a third end closure to be "affixed in closing relation to the cavity of the first end closure for containing the related rotating machine within the cavity of said first end closure". The Examiner contends that the third end closure is the element 79. 79, however is defined in the reference as a "carrier" of the same transmission that is contained and something can not contain itself. Furthermore a carrier is an open element that carries planet gears and thus can not form a "closure".

Claim 3 depends on claim 1 and further defines the housing of the rotating electrical machine as "the first and second end closures are axially spaced from each other and the second end closure is integrally formed with an axially extending cylindrical center section". Thus the cavity is formed in the first end closure not that formed with the integral cylindrical center section. In Nakanosono the opposite is true so there is no anticipation.

Claim 4 stands with claim 3, upon which it depends.

Claim 5 also depends on claim 3, but recites a different embodiment than claim 4 and thus if claim 4 is met by the reference, claim 5 can not be. As a fact neither claim 4 nor claim 5 are met by the reference. In fact the Examiner is again wrong in asserting that the end wall 29 of the reference is spaced from its integral portion 28.

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Claim 8 is rejected under 35 USC 102, but it depends on claim 7 which has been rejected under 35 USC 103, so this rejection is clearly in error and should be reversed.

Likewise claim 10 is rejected under 35 USC 102, but it depends on claim 9 which has been rejected under 35 USC 103, so this rejection is clearly in error and should be reversed.

Similarly claims 13-15 are rejected under 35 USC 102, but all depend directly or indirectly on claim 12 which has been rejected under 35 USC 103, so these rejections are clearly in error and should be reversed.

Claim 17 through 25 depend on claim 1 and call for "a cylindrical post extending into a cylindrical opening in the rotor for journaling said rotor within the outer housing". The Examiner incorrectly alleges that this cylindrical post is the element 33 in Nakanosono. This reading is incorrect in several regards. First the post must be carried by the end closure that forms the cavity. The Examiner contends that that end closure is the element 29 not the second end closure as contended by the Examiner.

Further the claim requires this post to extend into a cavity in the rotor. However the rotor in the reference has no opening and it itself is spaced from the element 33 so the rejections of this group of claims should be reversed.

Her reading of claim 18 on Nakanosono is also incorrect as the claim requires the extent of penetration to be "substantial" while there is as noted above no penetration in the reference.

Claim 19 depends on claim 18 and in addition still further distinguishes over the reference in calling for the provision of a bearing between the post. The bearing 44 referred to by the Examiner in Nakanosono does not engage the element 33 as the claim requires nor is the bearing in any opening in the rotor.

Claims 21 and 22 depend on claim 19 and stand or fall with it.

Claim 24 depends on claim 22 and stands or falls with it.

Claim 25 depends on claim 21 and calls for the post to be formed integrally with the end wall. Thus it clearly differentiates from claim 22 which calls for it to be a separate element, but it is rejected on the same ground, thus indicating a conflict in the Examiner's position that seems to require reversal.

Claims 6, 7, 9, 11 and 12 are rejected on the combination of Nakanosono with Takagi et al 6,081,056 (Takagi). These claims are all accepted to stand or fall together with the claims upon which they depend. That is claims 6 and 7 stand or fall with claim 5, claim 9 stands or falls with claim 1 and claims 11 and 12 stand or fall with claim 10.

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Claims 20 and 23 are rejected on another combination, but stand or fall with claims 19 and 22, respectively.

Turning now to the remaining independent claim, claim 27, this claim and those that depend on it recite in independent form the post support for the rotor as called out in claim 17 without the "cavity" feature of that claim. As demonstrated above, it is submitted that the rejections of these claims is not sustainable.

Claim 27 calls for a post carried by one of the end walls to extend into a cylindrical opening in the rotor for journalling it. The Examiner has referred to the post 33 in Nakanosono, but it does not extend into an opening in the rotor 43, as there is none. Thus the claim is not anticipated and the rejection should be reversed.

Claim 28 recites the same distinction as already discussed with 18 and claim 29 recites the same distinction as claim 19 thus the previously made arguments as to patentability are incorporated herein by reference. The claims do not stand or fall together due to their different dependency.

Claims 30 and 31 stand or fall with claim 29.

Claims 32-34 stand or fall with claims 27, 30 and 31, respectively.

Claim 35 recites the same patentable distinction as claim 25 thus the previously made arguments as to patentability are incorporated herein by reference. The claims do not stand or fall together due to their different dependency.

In summary it is submitted that all of the rejections made by the Examiner are not well founded and a reversal of all of them is respectfully requested.

Respectfully submitted:



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APPENDIX

CLEAN COPY OF CLAIMS ON APPEAL

1. A DC rotating electrical machine comprised of an outer housing forming a stator of said DC rotating electrical machine, said outer housing being comprised of a generally cylindrical center section and affixed first and second end closures, a rotor journaled within said outer housing and extending through said first end closure for driving connection to a related rotating machine, said first end closure forming a cavity in which a substantial portion of said related rotating machine is contained.
2. A DC rotating electrical machine as set forth in claim 1 wherein a third end closure is affixed in closing relation to the cavity of the first end closure for containing the related rotating machine within the cavity of said first end closure.
3. A DC rotating electrical machine as set forth in claim 1 wherein the first and second end closures are axially spaced from each other and the second end closure is integrally formed with an axially extending cylindrical center section.
4. A DC rotating electrical machine as set forth in claim 3 wherein the first end closure is in abutting relation to the axially extending cylindrical center section.
5. A DC rotating electrical machine as set forth in claim 3 wherein the first end closure is axially spaced from the axially extending cylindrical center section.
6. A DC rotating electrical machine as set forth in claim 5 wherein the DC rotating electrical machine includes a stator made up a plurality of field coils.
7. A DC rotating electrical machine as set forth in claim 6 wherein the plurality of field coils are wound around a laminated core.
8. A DC rotating electrical machine as set forth in claim 7 wherein a portion of the laminated core is exposed between the first and second end closures.
9. A DC rotating electrical machine as set forth in claim 1 wherein the DC rotating electrical machine is brushless.
10. A DC rotating electrical machine as set forth in claim 9 further including a sensor contained within the outer housing for sensing the rotational position of said rotor.
11. A DC rotating electrical machine as set forth in claim 10 wherein the DC rotating electrical machine includes a stator made up a plurality of field coils.
12. A DC rotating electrical machine as set forth in claim 11 wherein a controller responsive to the output of the sensor switches the polarity of the field coils.
13. A DC rotating electrical machine as set forth in claim 12 wherein the controller is mounted in the interior of the DC rotating electrical machine.

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14. A DC rotating electrical machine as set forth in claim 13 wherein the controller is mounted axially between the first and second end closures.
15. A DC rotating electrical machine as set forth in claim 14 wherein the controller is mounted in a cylindrical member interposed between the first and second end closures.
16. A DC rotating electrical machine as set forth in claim 12 wherein the controller is mounted on the exterior of the DC rotating electrical machine.
17. A DC rotating electrical machine as set forth in claim 1 wherein the second end closure carries a cylindrical post extending into a cylindrical opening in the rotor for journaling said rotor within the outer housing.
18. A DC rotating electrical machine as set forth in claim 17 wherein the cylindrical post extends a substantial distance axially into the rotor.
19. A DC rotating electrical machine as set forth in claim 18 wherein the cylindrical post engages a bearing associated with the rotor.
20. A DC rotating electrical machine as set forth in claim 19 wherein the bearing associated with the rotor comprises an oil impregnated, sleeve type bearing.
21. A DC rotating electrical machine as set forth in claim 19 wherein the bearing associated with the rotor comprises an anti friction bearing.
22. A DC rotating electrical machine as set forth in claim 19 wherein the cylindrical post is detachably connected to the second end closure and engages a bearing associated with the rotor.
23. A DC rotating electrical machine as set forth in claim 22 wherein the bearing associated with the rotor comprises an oil impregnated, sleeve type bearing.
24. A DC rotating electrical machine as set forth in claim 22 wherein the bearing associated with the rotor comprises an anti friction bearing.
25. A DC rotating electrical machine as set forth in claim 21 wherein the cylindrical post is integrally formed with the second end closure.
26. A DC rotating electrical machine as set forth in claim 1 in combination with a hydraulic powered steering booster and the DC rotating electrical machine comprises a motor and the associated rotating machine is a hydraulic pump.
27. A DC rotating electrical machine comprised of an outer housing forming a stator of said DC rotating electrical machine, said outer housing being comprised of a generally cylindrical center section closed at opposite ends by first and second end closures, a rotor within said outer housing and extending through said first end closures for driving connection to a related rotating machine, said second end closure carrying a cylindrical post extending into an cylindrical opening in said rotor for journaling said rotor within said outer housing.

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28. A DC rotating electrical machine as set forth in claim 27 wherein the cylindrical post extends a substantial distance axially into the rotor.

29. A DC rotating electrical machine as set forth in claim 28 wherein the cylindrical post engages a bearing associated with the rotor.

30. A DC rotating electrical machine as set forth in claim 29 wherein the bearing associated with the rotor comprises an oil impregnated, sleeve type bearing.

31. A DC rotating electrical machine as set forth in claim 29 wherein the bearing associated with the rotor comprises an anti friction bearing.

32. A DC rotating electrical machine as set forth in claim 27 wherein the cylindrical post is detachably connected to the second end closure.

33. A DC rotating electrical machine as set forth in claim 32 wherein the bearing associated with the rotor comprises an oil impregnated, sleeve type bearing.

34. A DC rotating electrical machine as set forth in claim 32 wherein the bearing associated with the rotor comprises an anti friction bearing.

35. A DC rotating electrical machine as set forth in claim 27 wherein the cylindrical post is integrally formed with the second end closure.

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